

PATENT ABSTRACTS OF JAPAN

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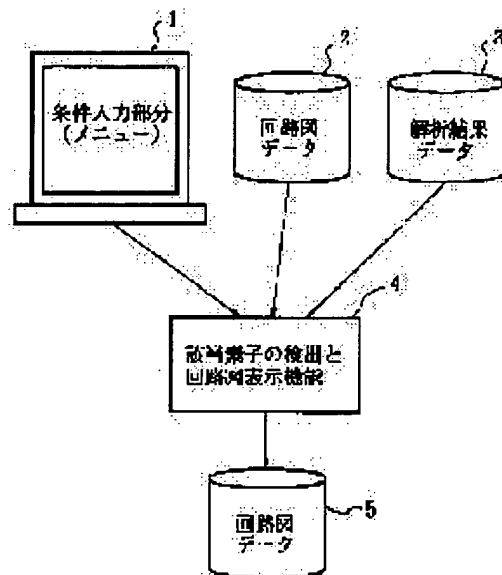
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(54) METHOD FOR DETECTING SATURATION/WITHSTAND VOLTAGE VIOLATION ELEMENT

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a method and device capable of detecting a saturation/ withstand voltage violation element, speedily and surely while preventing the omission of detection.

SOLUTION: In this method for detecting an element exceeding a saturation voltage value and/or a withstand voltage value, a circuit diagram data 2 showing a circuit diagram where the element is used, and analysis result data 3 analyzing the terminal voltage of the element are given. The saturation voltage value and/or a withstand voltage value condition 1 is given and the element of saturation voltage and/or withstand voltage violation is shown on the circuit diagram.



LEGAL STATUS

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the detection approach of saturation and the violation component of a proof pressure. This invention can be used after analog circuit analysis as the verification approach of an analog circuit analysis result of investigating whether each transistor being over the saturation state and the proof-pressure value.

[0002]

[Description of the Prior Art] Conventionally, after analog circuit analysis, when it was investigated whether each component, for example, each transistor, is over the saturation state and the proof-pressure value, the check by viewing was performed.

[0003] That is, if it was in the conventional technique, as shown in drawing 3, the terminal voltage was displayed on display superiors about each component after DCOP or transient analysis, and it was checking visually.

[0004] That is, for example, as shown in drawing 3, the electrical potential difference concerning each transistor obtained by the analysis result, for example, simulation, is obtained as an analysis result, and it considers as the analysis result data 3. Since the electrical potential difference of the terminal of each transistor is known, while displaying a circuit diagram on a display with circuit diagram data by this, terminal voltage of each transistor is carried out display 6 on a circuit diagram.

[0005] The terminal voltage of each transistor in the circuit diagram displayed on the display as mentioned above is seen, and these judge [a saturation state and] visually whether it is over the proof-pressure value again, and carry out it detection 7. In addition, the value of these saturation and the violation electrical potential difference of a proof pressure changes with each process and circuits.

[0006] However, the component which should be checked visually has increased with large-scale-izing of a circuit in recent years. For this reason, the fault number of cases has been increasing -- come to require detection time seriously or an oversight (leakage in detection) arises.

[0007]

[Problem(s) to be Solved by the Invention] This invention was made in view of the above-mentioned situation, and the purpose of this invention can detect the component of saturation and violation of a proof pressure promptly, and it is offering the detection approach of saturation and the violation component of a proof pressure an oversight (leakage in detection) being prevented and positive detection being performed, and detection equipment.

[0008]

[Means for Solving the Problem] The detection approach of the saturation and the violation component of a proof pressure concerning this invention is the detection approach of saturation and the violation component of a proof pressure of detecting the component exceeding a saturation-voltage value and/or a proof-pressure electrical-potential-difference value, gives a saturation-voltage value and/or proof-pressure electrical-potential-difference value conditions, and considers them as the configuration which specifies this on a circuit diagram about the component of saturation voltage and/or proof-pressure

electrical-potential-difference violation while it gives the circuit diagram data in which the circuit diagram where a component is used is shown, and the analysis result data which analyzed the terminal voltage of a component.

[0009] The detection equipment of the saturation and the violation component of a proof pressure concerning this invention While inputting the circuit diagram data in which it is detection equipment of the saturation and the violation component of a proof pressure which detects the component exceeding a saturation voltage value and/or a proof-pressure electrical-potential-difference value, and the circuit diagram where a component is used is shown, and the analysis result data which analyzed the terminal voltage of a component About the component of saturation voltage and/or proof-pressure electrical-potential-difference violation, it considers as the configuration which specifies this on the circuit diagram on this display at the same time it inputs a saturation voltage value and/or proof-pressure electrical-potential-difference value conditions and displays a circuit diagram on a display.

[0010] Since the violation component was detected by whether it agrees on this condition as a saturation voltage value and/or proof-pressure electrical-potential-difference value conditions are given according to this invention, compared with detection visually, detection time can be shortened, and an oversight (leakage in detection) can be controlled, and positive detection can be performed. And it can constitute so that a saturation voltage value and/or proof-pressure electrical-potential-difference value conditions may be inputted into arbitration, and it is possible to set the condition value which therefore changes with a process or circuits as arbitration, and, therefore, it is rich in versatility. Moreover, since a violation component is specified, for example, is specified by flashing etc. on the circuit diagram on a display, it is easy to detect and sure to detect. In addition, although the technique of verifying a circuit in the simulation approach of an electronic circuitry is shown in JP,7-129656,A, this invention is the technique in which configurations differ.

[0011]

[Embodiment of the Invention] The gestalt of desirable operation of this invention is explained hereafter, and the example of a gestalt of concrete desirable operation is further explained with reference to a drawing. However, although it is natural, this invention is not limited to the following explanation and the example of a gestalt of implementation of illustration.

[0012] On the occasion of operation of this invention, versatility can be given as the input to arbitration being possible according to a circuit in a saturation voltage value.

[0013] on the occasion of operation of this invention, a proof-pressure electrical-potential-difference value can be boiled according to a process, and versatility can be given to arbitration as an input being possible.

[0014] On the occasion of operation of this invention, the designation can be performed by the display by flashing on the circuit diagram on a display about the component of saturation voltage and/or proof-pressure electrical-potential-difference violation. Below, the example of a gestalt of concrete operation is described.

[0015] The example of a gestalt of the one example operation of a gestalt of operation applies this invention, when detecting the transistor of saturation and the violation component of a proof pressure. It applied, when verifying especially based on an analog analysis result (simulation result). According to this example, this is solvable, although the trouble of the increment in the fault number of cases by visual detection time and the leakage in detection had committed with large-scale-izing of a circuit as mentioned above.

[0016] In this example, the user was made to input the saturation and the violation electrical-potential-difference value of a proof pressure (for example, the violation electrical-potential-difference value between collector emitters, the violation electrical-potential-difference value between the emitter-bases) which changes respectively with a circuit and processes, and it indicated by flashing on the circuit diagram, and the corresponding component was made into the gestalt of which it warns.

[0017] The configuration of this example is shown in drawing 1 and drawing 2. With reference to drawing 1, it explains first. Among drawing 1, a sign 1 is a condition input part and this is a menu part which inputs the saturation voltage value used as the criteria of being violation, and a proof-pressure

electrical-potential-difference value. A sign 2 is circuit diagram data and is data for displaying a circuit diagram on a display. A sign 3 is analysis result data and is data of the electrical-potential-difference value given to each terminal of a transistor obtained in analog analysis (simulation). A sign 4 shows detection and circuit diagram display capabilities of an applicable component, and is data for carrying out the alarm display (here flashing display) of the component (violation transistor) which corresponds with a circuit diagram on a display here. A sign 5 is circuit diagram data for a display, and is data with the data which should be displayed about the above-mentioned applicable component (flashing display).

[0018] In the example of a gestalt of this operation, the circuit diagram data 2 and the analysis result data 3 are read with the saturation and the proof-pressure electrical-potential-difference value conditions of having been inputted into the condition input part 1 (menu part), the saturation and the violation transistor of a proof pressure applicable to violation are detected, and the circuit diagram data 5 which added the flashing graphic form to the applicable component (violation transistor) are created. Therefore, the alarm display (flashing display) of the component (violation transistor) which corresponds with a circuit diagram on a display can be carried out. Consequently, time amount can be shortened from the case of detection by viewing, and the problem of the increment in the fault number of cases by the leakage in detection can be solved.

[0019] A monograph affair can be set up and inputted into arbitration about the input to the condition input part 1 (menu part). Since saturation and a proof-pressure electrical-potential-difference value change with a circuit or processes, it is having enabled it to input freely in this way, and versatility can be given. For example, a saturation voltage value enables a setup to arbitration according to a circuit, and a setup of a proof-pressure electrical-potential-difference value to arbitration can be enabled according to a process.

[0020] With reference to drawing 2, in this example, it judges whether it is violation about each component (each transistor), and explains per [which verifies whether flashing information is attached] flow.

[0021] Retrieval 11 of a component (transistor) is performed from the circuit diagram data 2. Next, acquisition 12 of terminal voltage which receives the terminal voltage of the searched component from the analysis result data 3 is performed. From the terminal voltage value which came to hand, calculation 13 of the electrical-potential-difference value V_{ce} between collector emitters and the electrical-potential-difference value V_{eb} between the emitter-bases is performed. The electrical-potential-difference value corresponds to an input condition, namely, in being violation exceeding a reference value, it makes the data of a flashing graphic form the component carried out applicable 14 addition 15. By this, when it displays on a display, the alarm display of the component which corresponds all over a circuit diagram will be specified and carried out with a flashing graphic form. Thus, it verifies about each component.

[0022] Since according to the example of a gestalt of this operation saturation and the violation component of a proof pressure (transistor) are detected and automatic warning of it is carried out as explained above, the time amount which the conventional visual detection had taken can reduce this, and can reduce the fault number of cases by the leakage in detection. Moreover, a setup of the arbitration of saturation and a proof-pressure electrical-potential-difference value and an input can be performed, and it is flexible.

[0023]

[Effect of the Invention] As mentioned above, according to the detection approach of of the saturation and the violation component of a proof pressure concerning this invention, and detection equipment, it is possible to detect the component of saturation and violation of a proof pressure promptly, and an oversight (leakage in detection) can be prevented, and positive detection can be performed, and it is effective in being flexible.

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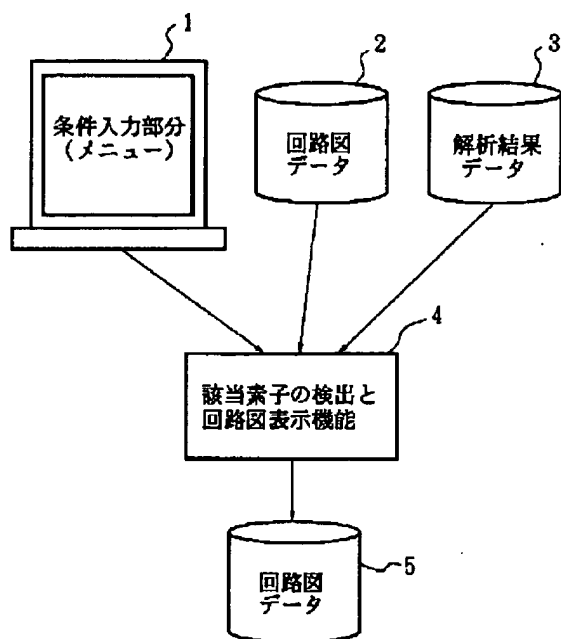
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DRAWINGS

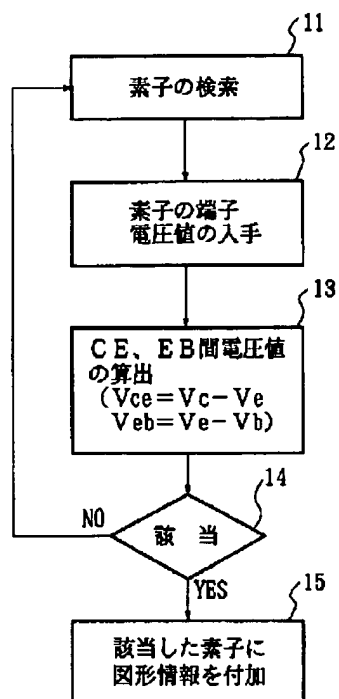
[Drawing 1]

実施の形態例 1 の構成



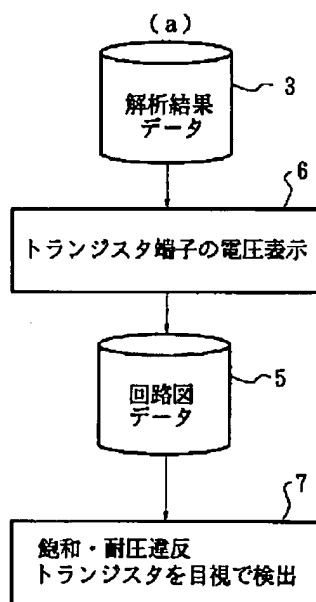
[Drawing 2]

実施の形態例 1 の構成



[Drawing 3]

従来の技術



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